**IN THE CLAIMS:**

1. (Currently Amended)     A method for initiating a peer-to-peer communication ses-
sion, the method comprising:

        initiating a boot process;

        initializing a cluster connection manager early in the booting process;

        ~~attempting~~ initiating, initiating by the cluster connection manager, a first remote
direct memory access (RDMA) read operation directed to a cluster partner ~~having an op-~~
~~erating system~~ before a storage operating system executing on the cluster partner is fully
active, the RDMA read operation bypassing the operating system;

        performing, in response to a successful first RDMA read operation, a first RDMA
write operation to the cluster partner;

        performing, in response to a successful RDMA write operation, a second RDMA
read operation directed to the cluster partner; and

        performing, in response to a successful second RDMA read operation, a second
RDMA write operation to the cluster partner earlier in the booting process.

2. (Original)   The method of claim 1 wherein the step of attempting a first RDMA read
operation further comprises the step of issuing a RDMA read operation to the cluster
partner requesting a pre-set memory address location that is associated with a status vari-
able on the cluster partner.

3. (Previously Presented)     The method of claim 1 further comprising :

        exchanging a set of peer connection information;

        passing a set of client information to the cluster partner;

        creating a set of appropriate communication ports;

        alerting the cluster partner of a ready status; and

        alerting a set of clients that the cluster partner is in a ready state.

4. (Original)    The method of claim 3 wherein the set of peer connection information comprises a version number.

5. (Previously Presented)    The method of claim 1 wherein the step of passing a set of client information to the cluster partner further comprises :

      collecting, from a set of clients, the set of client information; and

      transferring the collected set of client information to the cluster partner.

6. (Original)    The method of claim 5 wherein the client information comprises a number of communication ports required.

7. (Original)    The method of claim 5 wherein the set of client information further comprises an amount of memory requested by a particular client.

8. (Original)    The method of claim 1 wherein the cluster partner is a storage system.

9. (Original)    The method of claim 1 wherein the cluster partner is an application server.

10.-12. (Cancelled)

13. (Currently Amended)    A method for initiating a peer-to-peer communication session, the method comprising :

      <u>initiating a booting process;</u>

      <u>initializing a cluster connection manager early in the booting process;</u>

      performing, <u>by a cluster connection manager,</u> a first remote direct memory access <u>(RDMA)</u> read operation directed to a cluster partner <u>before a storage operating system executing on the cluster partner is fully active</u>~~having an operating system~~, the RDMA read operation bypassing the operating system; and

3

9      performing, in response to a successful first remote direct memory access read

10   operation, a first remote direct memory access write operation to the cluster partner <u>ear-</u>

11   <u>lier in the booting process</u>.

14. (Original) The method of claim 13 wherein the first remote direct memory access

2   read operation is performed over a Virtual Interface connection having a pre-determined

3   and pre-assigned Virtual Interface Number and a pre-determined Fibre Channel ID.

15. (Currently Amended)    A method comprising :

2      <u>initiating a boot process;</u>

3      <u>initializing a cluster connection manager early in the boot process;</u>

4      <s>(a)</s>initiating<u>, early in the booting process,</u> a peer-to-peer communication session<u>,</u>

5   <u>by a cluster connection manager, before a storage operating system executing on the clus-</u>

6   <u>ter partner is fully active</u> which bypasses an operating system on a storage system by at-

7   tempting first remote direct memory access read operation directed to a predefined

8   hardware address and a predefined port number, the predefined hardware address and the

9   predefined port number previously known to support a RDMA operation; and

10      <s>(b)</s>performing <u>early in the booting process,</u> in response to a successful <s>step</s>

11   <s>(a).</s><u>initiating,</u> a first remote direct memory access write operation directed to the prede-

12   fined hardware address and the predefined port number.

16. (Currently Amended)    The method of claim 15 further comprising:

2      <s>(c)</s>performing, in response to a successful <s>step (b)</s><u>first remote direct memory ac-</u>

3   <u>cess write</u>, a second remote direct memory access read operation directed to the prede-

4   fined hardware address and the predefined port number.

17. (Original) The method of claim 15 wherein the predefined hardware address com-

2   prises a fibre channel identifier.

1    18. (Original)  The method of claim 15 wherein the predefined port number comprises a

2    virtual interface.

1    19. (Original)  The method of claim 15 wherein the first remote direct memory access is

2    delivered to a predefined memory address storing booting status information.

1    20. (Currently Amended)      A system configured to establish reliable peer-to-peer

2    communication among storage systems of a clustered environment, the system compris-

3    ing:

4            a booting process executed by a processor;

5            a peer process executing on each storage system partner having an operating sys-

6    tem; and

7            a cluster connection manager executing on each storage system partner, the clus-

8    ter connection manager establishing a reliable peer-to-peer connection between each peer

9    process early in the booting process before a storage operating system executing on a

10   cluster partner is fully active by connecting to a predetermined port number using a pre-

11   determined network address, the reliable peer-to-peer connection bypassing the operating

12   system.

1    21. (Original)  The system of claim 20 wherein the reliable peer-to-peer connection is

2    established without requiring a storage operating system executing on each storage sys-

3    tem partner to be fully functioning.

1    22. (Original)  The system of claim 20 wherein the peer-to-peer connection is a virtual

2    interface connection.

1    23. (Original)  The system of claim 20 wherein the peer process is a cluster connection

2    client that requests services from the cluster connection manager.

24. (Currently Amended)     A system configured to open an initial peer-to-peer connec-
tion over a cluster interconnect, the system comprising:

a storage system having an operating system;

a booting process executed by a processor;

a cluster connection manager executing on the storage system, the cluster connec-
tion manager configured to establish a peer connection early in the booting process be-
fore a storage operating system executing on a cluster partner is fully active on a prede-
termined port number and using a predetermined network address within the storage sys-
tem the peer-to-peer connection bypassing the operating system; and

a process executing on the storage system, the process configured to use the estab-
lished peer connection for communication.

25. (Previously Presented)     The system of claim 24 wherein the peer-to-peer connec-
tion is a virtual interface connection.

26. (Previously Presented)     The system of claim 24 wherein the process executing on
the storage system is a cluster connection client that requests services from the cluster
connection manager.

27. (Previously Presented)     The system of claim 24 wherein the process executing on
the storage system communicates with a cluster partner using the established peer con-
nection.

28. (Currently Amended)     A system configured to accept the initiation of a peer-to-
peer connection over a cluster interconnect, the system comprising:

a storage system having an operating system;

a booting process executed by a processor;

a cluster connection manager executing on the storage system, the cluster connection
manager configured to accept a peer connection on a predetermined port number and us-

7  ing a predetermined network address within the storage system ~~early in the booting proc-~~

8  ~~ess before a storage operating system executing is fully active~~ the peer-to-peer connection

9  ~~bypassing the operating system~~; and

10      a process executing on the storage system, the process configured to read infor-

11  mation from the established peer connection.

1  29. (Previously Presented)    The system of claim 28 wherein the peer-to-peer connec-

2  tion is a virtual interface connection.

1  30. (Previously Presented)    The system of claim 28 wherein the process executing on

2  the storage system is a cluster connection client that requests services from the cluster

3  connection manager.

1  31. (Previously Presented)    The system of claim 28 wherein the process executing on

2  the storage system reads information from a cluster partner.

1  32. (Previously Presented)    The system of claim 28 wherein the information comprises

2  heartbeat signals.

1  33.  (Currently Amended) A method comprising:

2      initiating a boot process;

3      initializing a cluster connection manager early in the boot process;

4      initializing, early in the booting process, a first remote direct memory access

5  (RDMA) read operation that bypasses the ~~operation~~ operating system and is directed to a

6  specific cluster partner ~~before~~ before a storage operating system executing on a cluster

7  partner is fully active ~~a higher virtual interface layer has fully initialized~~, using a specific

8  port number and a specific address that support a RDMA operations; and

9       performing a second RDMA read operation directed to a specific cluster partner

10   before a higher virtual interface layer has fully initialized, using a specific port number

11   and a specific address that support a RDMA operations.


1   34. (Currently Amended) A system configured to accept the initiation of a peer-to-peer

2   connection over a cluster interconnect, the system comprising:

3       a storage system having an operating system;

4       <u>a booting process executing on the storage system;</u>

5       a cluster connection manager executing on the storage system, the cluster connec-

6   tion manager configured to initialize a first remote direct memory access (RDMA) read

7   operation that bypasses the operation system and is directed to a specific cluster partner

8   <u>early in the booting process before a storage operating system executing on a cluster part-</u>

9   <u>ner is fully active</u> ~~before a higher virtual interface layer has fully initialized~~ and use a

10   specific port number and a specific address that support RDMA operations; and

11       a process executing on the storage system, the process configured to use the estab-

12   lished peer-to-peer connection for communication.


1   35. (Currently Amended) <u>A computer readable medium containing executable program</u>

2   <u>instructions executed by a processor, comprising</u>~~A computer readable medium for accept-~~

3   ~~ing the initiation of a peer-to-peer connection over a cluster interconnect, the computer~~

4   ~~readable medium including program instructions when executed adapted to~~:

5       <u>program instructions that initiate a booting process;</u>

6       <u>program instructions that initialize a cluster connection manager early in the boot-</u>

7   <u>ing process;</u>

8       program instructions that ~~attempting~~ <u>initiate, early in the booting process,</u> a first

9   remote direct memory access (RDMA) read operation <u>before a storage operating system</u>

10   <u>executing on a cluster partner is fully active</u>~~that bypasses the operation system and is di-~~

11   ~~rected to a cluster partner~~;

12      <u>program instructions that perform</u>~~performing~~, in response to a successful first

13    RDMA read operation, a first RDMA write operation to the cluster partner;

14      <u>program instructions that perform</u>~~performing~~, in response to a successful RDMA

15    write operation, a second RDMA read operation directed to the cluster partner; and

16      <u>program instructions that perform early in the booting process</u>~~performing~~, in re-

17    sponse to a successful second RDMA read operation, a second RDMA write operation to

18    the cluster partner.